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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,929	03/30/2004	Edward W. Boyd	TEK03-1004	7928

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EXAMINER	
CHU, WUTCHUNG	
ART UNIT	**PAPER NUMBER**
2619	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,929	BOYD, EDWARD W.	
	Examiner	Art Unit	
	Wutchung Chu	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-8,11,13-17,20-23,26,28-32,35-38,41 and 43-45* is/are rejected.

7)☒ Claim(s) *4,9,10,12,18,19,24,25,27,33,34,39,40 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "the shadow binary-search table is more balanced than the working binary search table" is vague and indefinite because it is not known the metes and bounds of the claimed invention.

Claim Rejections - 35 USC § 103

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 6, 8, 11, 13-15, 16, 21, 23, 26, 28-30, 31, 36, 38, 41, 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pullela et al., hereinafter Pullela, (US7313667), in view of Sala et al., hereinafter Sala, (US2003/0117998).

Regarding claims 1, 16, and 31, Pullela discloses a methods and apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing **(see Pullela col. 2 lines 38-57)** and program instructions for cause apparatus to perform functions **(see Pullela col. 5 lines 45-55)** comprising:

- receiving a packet at the central node **(see Pullela col. 2 lines 60 packet is received)**;
- obtaining a first set of results by performing a first lookup based on a first set of values derived from the packet **(see Pullela col. 2 lines 65 first mapped packet field value)**;
- obtaining a second set of results by performing a second lookup based on a second set of values derived from the packet **(see Pullela col. 2 lines 67 second mapped packet field value)**;
- producing a merged value by merging the first set of results and the second set of results **(see Pullela col. 3 lines 67 new value and combining these mapped values into mapped entries)**;
- obtaining a subsequent result by performing a subsequent lookup with the merged value **(see Pullela col. 4 lines 1 mapped entries)**; and

disclose all the subject matter of the claimed invention with the exception of:

- if the packet is a downstream packet,
    - deriving a logical identifier corresponding to one or more remote nodes from the subsequent result,
    - incorporating the logical identifier into the packet, and
    - transmitting the packet to one or more remote nodes.

Sala from the same or similar fields of endeavor teaches the use of downstream channel and the downstream is formatted with an Ethernet entity **(see Sala paragraph 51)**, and Vlan tag control information field contains the Vlan identifier which uniquely identifies the Vlan to which the Ethernet frame belongs **(see Sala paragraph 64)** and going to multiple ports **(see Sala paragraph 45 and figure 1)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the downstreaming to more than one ports/users and Vlan ID tagging as taught by Sala in the apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing Pullela in order to recognize the origination and/or destination of a particular frame, and to implement filtering operation **(see Sala paragraph 12)**.

Regarding claims 6, 21 and 36, Pullela and Sala teaches further comprising producing a third set of results by performing a third lookup **(see Pullela col. 6 lines 52-56)** based on a third set of values derived from the packet; and wherein producing the merged value involves merging the first, second, and third sets of results **(see Pullela col. 3 lines 9-31)**.

Regarding claims 8, 23, and 36, Pullela discloses all the subject matter of the claimed invention with the exception of:

- teaches wherein if the packet is a downstream packet, the third set of values includes a destination media access control (MAC) address of the packet; and
- wherein if the packet is an upstream packet, the third set of values includes a source MAC address of the packet.

Sala from the same or similar fields of endeavor teaches the use of learn port associations with MAC **(see Sala paragraph 128)** and MAC control updates or prepares a downstream PON tag for each frame **(see Sala paragraph 130)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the MAC control updates of a downstream PON tag and learn port associations with MAC as taught by Sala in the apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing Pullela in order to enhance system.

Regarding claims 11, 26 and 41, Pullela teaches each of the first, second, and third sets of results includes:

a discard value **(see Pullela col. 1 line35)**;

a quality of service (QoS) value **(see Pullela col. 1 line39)**;

a destination value **(see Pullela col. 1 line38)**; and

wherein the QoS value and destination value are used to produce **(see Pullela col. 1 lines 35-52 where packets are being processed of their classes)** the merged

value **(see Pullela col. 2 line 38 – col. 3 lines 8 where this new value is of the combined first and second mapped values which were packet processed)** and Pullela does not explicitly teaches:

- wherein the discard value indicates whether the merged value should be discarded.
- three priority numbers setting the priority of the discard value, QoS value, and destination value, respectively;

In the background of Pullela teaches that a switch or router, typically receives, processes, and forwards or discards a packet based on one or more criteria, including the type of protocol used by the packet, addresses of the packet (e.g., source, destination, group), and type or quality of service requested. **(see Pullela col. 1 lines 35-42),** a packet is discard based on the criteria as Pullela discloses in the background and therefore it indicates whether the packet should be discarded. Pullela teaches Quality of service **(see Pullela col. 1 line 35-42 and col. 1 line 67)** and priority **(see Pullela col. 9 line 24)**. Although Pullela does not explicitly teaches using three priority number for prioritization, i would have been obvious to one of ordinary skill in the art at the time the invention was made to include priority number, because numbering the packet priority, as in Pullela, is a method for prioritizing/classifying packet.

Regarding claims 13, 28 and 43, Pullela teaches the subsequent result includes a queue index which specifies a queue where the packet can be stored before the packet is transmitted **(see Pullela col. 5 lines 38-44)**.

Regarding claims 14-15, 29-30, and 44-45, Pullela discloses all the subject matter of the claimed invention with the exception of:

- (claim 14) the subsequent result includes a logical identifier which specifies one or more remote nodes to which the packet is destined if the packet is a downstream packet.
- (claim 15) the subsequent result includes a VLAN identifier.

Sala from the same or similar fields of endeavor teaches the use of downstream channel and the downstream is formatted with an Ethernet entity **(see Sala paragraph 51)**, and Vlan tag control information field contains the Vlan identifier which uniquely identifies the Vlan to which the Ethernet frame belongs **(see Sala paragraph 64)** and going to multiple ports **(see Sala paragraph 45 and figure 1)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the downstreaming to more than one ports/users and Vlan ID tagging as taught by Sala in the apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing Pullela in order to recognize the origination and/or destination of a particular frame, and to implement filtering operation **(see Sala paragraph 12)**.

6. Claims 2, 17, and 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pullela and Sala as applied to claims 1, 16, and 31 above, and further in view of Tsuruoka (US6546391).

Regarding claims 2, 17, and 32, Pullela and Sala discloses all the subject matter of the claimed invention with the exception of:

- the first lookup involves directly addressing one or more entries of a direct-search table by offsetting one or more base addresses based on the first set of values.

Tsuruoka from the same or similar fields of endeavor teaches the use of network prefixes from the IP address is allocated as an offset to search the table **(see Tsuruoka col. 11 lines 43-65 direct- search table is not further specified of its functionality therefore it is interpreted broadly as any table, and network prefixes corresponds to first values)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the offsetting to search the table as taught by Tsuruoka in the apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing Pullela in order to enhance system efficiency.

7. Claims 5, 7, 20, 22, 35, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pullela and Sala as applied to claim 1 above, and further in view of Noven (US5884297).

Regarding claims 5, 20, and 35, Pullela and Sala teaches the second set of values; and wherein the second set of values **(see col. 3 lines 1-3)** includes a number of bits extracted from the packet **(see Pullela col. 4 lines 16 -20)**.

And discloses all the subject matter of the claimed invention with the exception of:

- the second lookup involves linearly searching one or more linear-search tables based on

Noven from the same or similar fields of endeavor teaches the use of linear search **(see Noven col. lines 52-60)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use linear search as taught by Noven in the apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing Pullela in order to enhance system searching efficiency in memory accessing **(see Noven col. 3 lines line 48-57)**.

Regarding claims 7, 22, and 37, Pullela and Sala the third lookup involves **(see Pullela 3 line 67 new value)**, and discloses all the subject matter of the claimed invention with the exception of:

- a binary search through a working binary-search table based on the third set of values.

Noven from the same or similar fields of endeavor teaches the use of binary search **(see Pullela col. 23 lines 57-63)**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Binary search as taught by Noven in the apparatus for mapping fields of entries into new values and combining these mapped values into mapped entries for use in lookup operations such as for packet processing

Pullela in order to enhance system searching efficiency in memory accessing **(see Noven col. 3 lines line 48-57)**.

Allowable Subject Matter

8. Claims 3, 4, 9, 10, 12, 18, 19, 24, 25, 27, 33, 34, 39, 40, and 42 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wicklund (US6034958); Karri et al. (US7212495); Beverly (US7313633); Wilson et al. (US2005/0175010); Kawasaki (US2003/0189937); Daniel et al. (US2004/0057437); Sarkinen et al. (US6904057).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wutchung Chu whose telephone number is 571 270 1411. The examiner can normally be reached on Monday - Friday 1000 - 1500EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan D. Orgad can be reached on 571 272 7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WC/
Wutchung Chu

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SUPERVISORY PATENT EXAMINER